

**HIGH PRECISION ORIENTATION ALIGNMENT AND GAP CONTROL
STAGES FOR IMPRINT LITHOGRAPHY PROCESSES**

ABSTRACT

Processes and associated devices for high precision positioning of a template on a substrate during imprint lithography includes a calibration system with a coarse calibration stage and a fine orientation stage capable of maintaining a uniform gap between the template and substrate. The fine orientation stage includes a pair of flexure members having flexure joints for motion about a pivot point intersected by first and second orientation axes. Actuators lengthen or shorten to expand or contract the flexure members. Separation of the template is achieved using a peel-and-pull method that avoids destruction of imprinted features from the substrate.